

**U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM**

SCIENTIFIC NAME: *Microlepidia strigosa* var. *mauiensis*

COMMON NAME: Palapalai

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: April 2010

STATUS/ACTION

☐ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status

☐ New candidate

☒ Continuing candidate

☐ Non-petitioned

☒ Petitioned - Date petition received: May 11, 2004

☐ 90-day positive - FR date:

☒ 12-month warranted but precluded - FR date: May 11, 2005

☐ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:

a. Is listing warranted (if yes, see summary of threats below)? Yes

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes

c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.

Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for the species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The "Progress on Revising the Lists" section of the current CNOR (<http://endangered.fws.gov/>) provides information on listing actions taken during the last 12 months.

☐ Listing priority change

Former LP: ☐

New LP: ☐

Date when the species first became a Candidate (as currently defined):

September 19, 1997

☐ Candidate removal: Former LP: ☐

☐ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

- ___ U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.
- ___ F – Range is no longer a U.S. territory.
- ___ I – Insufficient information exists on biological vulnerability and threats to support listing.
- ___ M – Taxon mistakenly included in past notice of review.
- ___ N – Taxon does not meet the Act’s definition of “species.”
- ___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Ferns and allies, Dennstaedtiaceae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, islands of Maui and Hawaii

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, islands of Maui, Hawaii, and Oahu

LAND OWNERSHIP: *Microlepia strigosa* var. *mauiensis* occurs on State land in the Hilo Watershed and upper Waiakea Forest Reserves (FR) on Hawaii; on private land (including Waikamoi Preserve), State (West Maui NAR), and federal land (Haleakala National Park) on Maui; and on County and private land on Oahu.

LEAD REGION CONTACT: Linda Belluomini, (503) 231- 6283, linda_belluomini@fws.gov

LEAD FIELD OFFICE CONTACT: Pacific Islands Fish and Wildlife Office, Christa Russell, (808) 792-9400, christa_russell@fws.gov

BIOLOGICAL INFORMATION

Species Description

Plants are terrestrial, medium-sized, with fronds less than 40 inches (in) (100 centimeters (cm)) long. This taxon is an extremely hairy variety of *Microlepia strigosa*, with the stipes, rachises, costae, and entire fronds covered with uniform, jointed hairs with pointed tips. The rachises are often zigzag (Palmer 2003).

Taxonomy

This taxon was originally described as *Microlepia mauiensis* by Wagner (1993), from a collection made at Hanaula, west Maui. In the most recent treatment of all Hawaiian ferns, Palmer (2003) recognizes this entity as an endemic variety of the indigenous *Microlepia strigosa*. Lau expressed some doubt that this entity represents a continuum of *Microlepia strigosa*, as it may be a distinct species (*Microlepia mauiensis*) (J. Lau, Hawaii Biodiversity and Mapping Program (HBMP), pers. comm. 2007). According to Lau, further taxonomic study is needed, as well as additional surveys statewide in suitable habitat (J. Lau, pers. comm. 2007).

Habitat/Life History

Typical habitat is mesic to wet forest at elevations between 1,394 and 6,004 feet (ft) (425 and 1,830 meters (m)) (Palmer 2003; HBMP 2008).

Historical Range

Little is known of the historical locations of *Microlepidia strigosa* var. *mauiensis*. The type was collected at Hanaula in the west Maui mountains (Wagner 1993).

Current Range/Distribution

Currently, *Microlepidia strigosa* var. *mauiensis* is found in the Waiakea and Hilo Watershed FRs, on the island of Hawaii; on west Maui at Pohakea and Poelua gulches, and on east Maui at Hanaula in The Nature Conservancy's Waikamoi Preserve and at Manawainui in Haleakala National Park; and on Oahu at Makaleha and Makaha Valley in the Waianae mountains (HBMP 2008; J. Lau, pers. comm. 2007; H. Oppenheimer, Plant Extinction Prevention (PEP) Program, pers. comms. 2007, 2008; P. Welton, National Park Service, pers. comm. 2008).

Population Estimates/Status

Microlepidia strigosa var. *mauiensis* is known from nine populations totaling at least 50 to more than 100 individuals on Maui, Hawaii, and Oahu (Palmer 2003; J. Lau, pers. comm. 2007; H. Oppenheimer, pers. comms. 2007, 2008; P. Welton, pers. comm. 2008). The island of Hawaii populations are at Saddle road (15 individuals) and Puu Oo trail (20 individuals) (HBMP 2008). Populations on west Maui occur at Poelua (numbers unknown), and Pohakea and Hanaula (at both sites, more than 100 total observed in 1984) gulches, and on east Maui in the Waikamoi Preserve (not uncommon) and at Manawainui (fewer than 20 individuals) (H. Oppenheimer, pers. comms. 2007, 2008; J. Lau, pers. comm. 2007; P. Welton, pers. comms. 2008, 2010; P. Bily, TNC, pers. comm. 2009). Populations on Oahu occur at Makaleha (a patch of individuals) and Makaha Valley (one individual), with many hybrids at west Makaleha (J. Lau, pers. comm. 2007; K. Kawelo, U.S. Army Environmental, pers. comm. 2009). Botanists suggest this variety may be more widespread, and could be found in more areas if surveys were conducted (J. Lau, pers. comm. 2007; K. Kawelo, U.S. Army Environmental, in litt. 2010).

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Microlepidia strigosa var. *mauiensis* is highly threatened by feral pigs (*Sus scrofa*) that degrade and destroy habitat (HBMP 2008; H. Oppenheimer, pers. comm. 2007; P. Bily, pers. comm. 2009).

Pigs of Asian ancestry were introduced to Hawaii by the Polynesians, and the Eurasian type was introduced to Hawaii by Cook in 1778, with many other introductions thereafter (Tomich 1986). Some pigs raised as food escaped into the forests of Hawaii, Kauai, Oahu, Molokai, Maui, and Niihau, formed herds, and are now managed as a game animal by the State to optimize hunting opportunities (Tomich 1986; State of Hawaii 2001). A study was conducted in the 1980s on feral pig populations in the Kipahulu Valley on Maui (Diong 1982). This valley consists of a diverse composition of native ecosystems, from near sea level to alpine, and forest types ranging from mesic to wet, *Acacia koa* (koa) to *Metrosideros polymorpha* (ohia), similar to the habitat of

Microlepidia strigosa var. *mauiensis*. Rooting by feral pigs was observed to be related to the search for earthworms, with rooting depths averaging 8 in (20 cm), greatly disrupting the leaf litter and topsoil layers, contributing to erosion and changes in ground topography. The feeding habits of pigs created seed beds, enabling the establishment and spread of weedy species such as *Psidium cattleianum* (strawberry guava). The study concluded that all aspects of the food habits of pigs are damaging to the structure and function of the Hawaiian forest ecosystem (Diong 1982). The effects on mesic and wet forest habitat by foraging of feral pigs have also been reported in fencing studies. In a fencing study conducted in the montane bogs of Haleakala, it was found that when feral pigs were fenced out of an area the cover of native plant species increased from 6 percent to 95 percent within six years of protection (Loope *et al.* 1991).

Hawaiian ecosystems, having evolved without hoofed mammals, are susceptible to large-scale disturbance by feral pigs and other introduced ungulates (Loope *et al.* 1991). Because of demonstrated habitat modifications by feral pigs such as destruction of native plants, disruption of topsoil leading to erosion, and establishment and spread of nonnative plants; the Service believes they are a threat to *Microlepidia strigosa* var. *mauiensis*.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

None known.

C. Disease or predation.

Predation by feral pigs is a likely threat to *Microlepidia strigosa* var. *mauiensis* (HBMP 2008; H. Oppenheimer, pers. comm. 2007; P. Bily, pers. comm. 2009). In a study conducted in the 1980s, feral pigs were observed browsing on young shoots, leaves and fronds of a wide variety of plants, of which over 85 percent were endemic species (Diong 1982). A stomach content analysis in this study showed that the pigs' food sources consisted of native plants, 60 percent of which were *Cibotium* spp. (tree ferns), alternating with *Psidium cattleianum* (strawberry guava) when it was available. Pigs were observed to fell plants and remove the bark of *Clermontia*, *Cibotium*, *Coprosma*, *Psychotria*, and *Hedyotis* species, with larger trees killed over a few months of repeated feeding (Diong 1982).

Because Hawaii's native plants evolved without any browsing or grazing mammals present, many lost natural defenses to such impacts (Carlquist 1980). Browsing by ungulates has been observed on many other native species, including common and rare or endangered species (Cuddihy and Stone 1990; Loope *et al.* 1991). Therefore, even though we have no evidence of browsing for this species, it is likely that pigs impact *Microlepidia strigosa* var. *mauiensis* directly as well as the surrounding habitat.

D. The inadequacy of existing regulatory mechanisms.

Microlepidia strigosa var. *mauiensis* currently receives no protection under Hawaii's endangered species law (HRS, Sect. 195-D) or the Federal Endangered Species Act (16 U.S.C. §1531-1544).

Pigs are managed in Hawaii as game animals, but many populate inaccessible areas where hunting is difficult, if not impossible, and therefore has little effect on their numbers (Hawaii Heritage Program 1990). Hunting is allowed on all islands either year-round or during certain months, depending on the area (Hawaii Department of Land and Natural Resources 1999, 2003);

however, public hunting is not adequate to eliminate this threat to *Microlepia strigosa* var. *mauiensis*.

E. Other natural or manmade factors affecting its continued existence.

This variety is threatened by alien plant species that degrade habitat and outcompete native plants (H. Oppenheimer, pers. comm. 2007). On west Maui, the nonnative plant species reported to be the greatest threats to *Microlepia strigosa* var. *mauiensis* are *Tibouchina herbacea* (glorybush) and *Clidemia hirta* (Koster's curse) (H. Oppenheimer, pers. comm. 2007); and on east Maui *Hedychium gardnerianum* (kahili ginger) poses a threat to those individuals at Waikamoi (P. Bily, pers. comm. 2009). The specific nonnative plant threats on Oahu and Hawaii Island are not described.

Clidemia hirta is a noxious shrub first cultivated on Oahu before 1941. This pest plant forms a dense understory, shading out native plants and hindering their regeneration, and is considered a major alien plant threat (Wagner *et al.* 1985; Smith 1989). The most promising biological control to date for Koster's curse is the *Colleotrichum* fungus, *Gloesporioides* f. sp. *clidemiae*, released in 1986. Although there is no quantitative data available, it has an observable negative impact. Other agents tested were a moth (*Antiblemma acclinalis*), a leaf feeding beetle (*Lius poseidon*), a fruit and flower-feeding insect (*Mompha trithalama*), and a terminal growth feeding insect (*Liothrips urichi*), all with lesser control success than the fungus (Smith 1989).

Hedychium gardnerianum is native to India (Nagata 1999). This showy ginger was introduced for ornamental purposes, and was first collected in 1954 at Hawaii Volcanoes National Park (Wester 1992). Kahili ginger grows over 3.3 ft (1 m) tall in open light environments, preferring a warm moist climate; however it will readily grow in full shade beneath a forest canopy (Smith 1985). It forms vast, dense colonies, displacing other plant species, and reproduces by rhizomes. The conspicuous, fleshy, red seeds are dispersed by fruit-eating birds as well as man. Aircraft-based analysis has found that ginger reduces the amount of nitrogen in the *Metrosideros* forest canopy in Hawaii, a finding subsequently corroborated by ground based sampling (Asner and Vitousek 2005). It may also block stream edges, altering water flow (Global Invasive Species Database 2005). Kahili ginger can be controlled by herbicides, but biological control is considered the only practical approach for the long-term management of large infestations in native forests. The ability of the bacterium *Ralstonia* (= *Pseudomonas*) *solanacearum* to cause bacterial wilt in kahili ginger in the field, together with its lack of virulence in other ginger species, contributes to its potential as a biological control agent (Anderson and Gardner 1999; Anderson 2003).

Tibouchina herbacea, a member of the Melastomataceae family, is native to southern Brazil, Uruguay, and Paraguay (Wagner *et al.* 1999a). In Hawaii, it is naturalized and abundant in disturbed mesic to wet forest on the islands of Hawaii, Lanai and is rapidly expanding its range over West Maui. It has become widely established in the lower half of Kapunakea Preserve over the last decade. People, pigs, and wind seem to be the primary vectors of this habitat-modifying weed. It forms dense thickets, crowding out all other plant species and inhibiting regeneration of native plants (The Nature Conservancy 2003). All members of this genus are declared noxious in the state of Hawaii (HAR Title 4, Subtitle 6, Chapter 68). Research is ongoing for biological controls of this species (Smith 1998; The Nature Conservancy 2003).

The original native flora of Hawaii consisted of about 1,400 species, nearly 90 percent of which were endemic. Of the current total native and naturalized Hawaiian flora of 1,817 taxa, 47 percent were introduced from other parts of the world, and nearly 100 species have become pests (Smith 1985; Wagner *et al.* 1999a). Several studies (Cuddihy and Stone 1990; Wood and Perlman 1997; Robichaux *et al.* 1998, p. 4) indicate nonnative plant species may outcompete native plants similar to *Microlepidia strigosa* var. *mauiensis*. Competition may be for space, light, water, or nutrients, or there may be a chemical produced that inhibits growth of other plants (Smith 1985; Cuddihy and Stone 1990). In addition, nonnative pest plants found in habitat similar to that of this species have been shown to make the habitat less suitable for native species (Smathers and Gardner 1978; Smith 1985; Loope and Medeiros 1992; Medeiros *et al.* 1992; Ellshoff *et al.* 1995; Meyer and Florence 1996; Medeiros *et al.* 1997, Loope *et al.* 2004). In particular, alien pest plant species degrade habitat by modifying availability of light, altering soil-water regimes, modifying nutrient cycling, or altering fire characteristics of native plant communities (Smith 1985; Cuddihy and Stone 1990; Vitousek *et al.* 1997). Because of demonstrated habitat modification and resource competition by nonnative plant species in habitat similar to mesic to wet forest habitat of *M. strigosa* var. *mauiensis*, the Service believes nonnative plant species are a threat to *M. strigosa* var. *mauiensis*.

In some cases, hybridization makes it difficult to clearly understand the status of the species in certain locations (K. Kawelo, U.S. Army Environmental, pers. comm. 2009).

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

The West Maui Mountain Watershed Partnership, a non-governmental, non-profit partnership composed of west Maui landowners and managers, received funding over five years (2000 to 2005) from the Service for ungulate exclosure fences, which have been completed, and for ungulate and nonnative plant control, which is ongoing (Service 2005). These actions may provide protection for the individuals of *Microlepidia strigosa* var. *mauiensis* in the west Maui Mountains.

The Nature Conservancy of Hawaii manages the Waikamoi Preserve on east Maui. This Preserve is largely funded through the State's Natural Area Reserve Partnership (NAP) program. A long-range management plan for this Preserve has been developed and implemented (The Nature Conservancy of Hawaii 1999). Conservation measures such as fence construction, monitoring, nonnative plant removal, and pig control as described in the plan may provide protection to individuals of *Microlepidia strigosa* var. *mauiensis* that occur within the Preserve.

SUMMARY OF THREATS

Based on our evaluation of habitat degradation and loss by feral pigs and nonnative plants, we conclude there is sufficient information to develop a proposed rule for this species (once the taxonomic questions have been resolved*) due to the present and threatened destruction, alteration, or curtailment of its habitat and range, and the displacement of individuals of *Microlepidia strigosa* var. *mauiensis*, due to competition with nonnative plants for space, nutrients, water, air, and light. Predation by feral pigs is a likely threat to *M. strigosa* var. *mauiensis*. We find that this species is warranted for listing throughout all of its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

*The taxonomic validity of this species must be resolved before developing a proposed listing rule.

RECOMMENDED CONSERVATION MEASURES

- Conduct taxonomic review
- Survey for populations of *Microlepidia strigosa* var. *mauiensis* in areas of potentially suitable habitat
- Control feral pigs
- Determine specific nonnative plant threats to populations in east Maui, Oahu, and Hawaii Island
- Control alien plants
- Begin propagation efforts for maintenance of genetic stock
- Reintroduce individuals into suitable habitat within historic range that is being managed for known threats to this species

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3*
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:

This variety is highly threatened by feral pigs that degrade and destroy habitat, and nonnative plants that compete for light and nutrients. Threats to the mesic to wet forest habitat of *Microlepidia strigosa* var. *mauiensis* occur throughout its range and are expected to continue or increase without control or eradication.

Immediacy of Threats:

Threats to *Microlepia strigosa* var. *mauiensis* from feral pigs and nonnative plants are considered imminent because they are ongoing.

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? No. This variety does not appear to be appropriate for emergency listing at this time because the immediacy of the threats is not so great as to imperil a significant proportion of the taxon within the time frame of the routine listing process. In addition, individuals of *Microlepia strigosa* var. *mauiensis* may benefit from conservation actions initiated by The Nature Conservancy of Hawaii, the Hawaii Division of Forestry and Wildlife Natural Area Reserves System, and the West and East Maui Mountain Watershed Partnerships. If it becomes apparent that the routine listing process is not sufficient to prevent large losses that may result in this species' extinction, then the emergency rule process for this species will be initiated. We will continue to monitor the status of *M. strigosa* var. *mauiensis* as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

DESCRIPTION OF MONITORING

Much of the information on this form is based on the results of a meeting of 20 botanical experts held by the Center for Plant Conservation in December of 1995. We incorporated additional information on this species from our files and the recently published manual on Hawaii's ferns, *Hawaii's Ferns and Fern Allies* (Palmer 2003). In 2004, the Pacific Islands Office contacted the following species experts: Robert Hobdy, retired from the Hawaii Division of Forestry and Wildlife; Joel Lau, Hawaii Natural Heritage Program; Arthur Medeiros, U.S.G.S. Biological Resources Discipline; Hank Oppenheimer, resource manager for the Maui Land and Pineapple Company; and Steve Perlman and Ken Wood, National Tropical Botanical Garden. No new status or range information was provided. In 2005 we contacted species experts, but received no new information on this taxon. In 2006 new status and range information was provided by Joel Lau, Hawaii Biodiversity and Mapping Program, and Hank Oppenheimer, Plant Extinction Prevention Program, and was incorporated into this assessment. In 2008 new information on status and range for this species was provided by Hank Oppenheimer, and by Patti Welton, National Park Service. In 2009 new information was provided by Pat Bily, TNC, and Kapua Kawelo, U.S. Army Environmental Division. In 2010 we contacted the species experts listed below and received new information from Kapua Kawelo.

List all experts contacted:

Name	Date	Affiliation
Agorastos, Nick	02/09/10	Hawaii Division of Forestry and Wildlife
Anderson, Stephen	02/09/10	National Park Service, Haleakala NP, Maui
Aruch, Sam	02/09/10	Private contractor
Bakutis, Ane	02/09/10	Plant Extinction Prevention Program, Molokai
Ball, Donna	02/09/10	U.S. Fish and Wildlife Service, Hawaii Island
Beavers, Sally	02/09/10	National Park Service, Hawaii Island
Bily, Pat	02/09/10	The Nature Conservancy, Maui

Bio, Kealii	02/09/10	Plant Extinction Prevention Program, Hawaii Island
Brosius, Chris	02/09/10	West Maui Mountains Watershed Partnership
Caraway, Vickie	02/09/10	Hawaii Division of Forestry and Wildlife, Oahu
Ching, Susan	02/09/10	Plant Extinction Prevention Program, Oahu
Cole, Colleen	02/09/10	Three Mountain Alliance
Conry, Paul	02/09/10	Hawaii Division of Forestry and Wildlife
Coordinator	02/09/10	East Maui Watershed Partnership
Duvall, Fern	02/09/10	Hawaii Division of Forestry and Wildlife, Maui
Fay, Kerri	02/09/10	The Nature Conservancy, Maui
Garnett, Bill	02/09/10	National Park Service, Kalaupapa, Molokai
Giffin, Jon	02/09/10	The Nature Conservancy, Hawaii Island
Haus, Bill	02/09/10	National Park Service, Haleakala NP, Maui
Higashino, Jennifer	02/09/10	U.S. Fish and Wildlife Service, Maui
Imada, Clyde	02/09/10	Bishop Museum
Jacobi, Jim	02/09/10	U.S.G.S.-Biological Resources Discipline
Kawakami, Galen	02/09/10	Hawaii Division of Forestry and Wildlife, Kauai
Kawelo, Kapua	02/09/10	U.S. Army, Environmental Division
Kier, Matt	02/09/10	U.S. Army, Environmental Division
Kiyabu, Brian	02/09/10	Amy Greenwell Botanical Garden
Kraus, Jim	02/09/10	U.S. Fish and Wildlife Service, Hakalau NWR
Medeiros, Arthur	02/09/10	U.S.G.S.- Biological Resources Discipline
Misaki, Ed	02/09/10	The Nature Conservancy, Molokai
Moriyasu, Patty	02/09/10	Volcano Rare Plant Facility, Hawaii Island
Moses, Wailana	02/09/10	The Nature Conservancy, Molokai
Nakai, Glynnis	02/09/10	U.S. Fish and Wildlife Service, Maui NWR
Oppenheimer, Hank	02/09/10	Plant Extinction Prevention Program, Maui Nui
Palomino, Anna	02/09/10	Olinda Rare Plant Nursery, Maui
Palumbo, David	02/09/10	National Park Service, Haleakala NP, Maui
Pepi, Vanessa	02/09/10	U.S. Navy, Environmental Contractor
Perlman, Steve	02/09/10	National Tropical Botanical Garden
Perry, Lyman	02/09/10	Hawaii Division of Forestry and Wildlife, Hawaii Island
Plunkett, Bryan	02/09/10	Lanai Forest and Watershed Partnership
Pratt, Linda	02/09/10	U.S.G.S., Biological Resources Division
Purell, Melora	02/09/10	Kohala Watershed Partnership
Seidman, Stephanie	02/09/10	Maui Nui Botanical Garden
Shishido, Glenn	02/09/10	Hawaii Division of Forestry and Wildlife, Maui
Silbernagle, Mike	02/09/10	U.S. Fish and Wildlife Service Oahu NWR Complex
Smith, Miranda	02/09/10	Koolau Mountains Watershed Partnership
Starr, Forest	02/09/10	U.S.G.S.-Biological Resources Discipline
Tanaka, Daniel	02/09/10	Puu Kukui Watershed Preserve
Ward, Joe	02/09/10	Puu Kukui Watershed Preserve
Welton, Patti	02/09/10	National Park Service, Haleakala NP, Maui
Wood, Ken	02/09/10	National Tropical Botanical Garden
Wysong, Michael	02/09/10	Hawaii Natural Area Reserve System, Kauai

The Hawaii Biodiversity and Mapping Program identified this subspecies as imperiled (HBMP 2006). Based on the International Union for Conservation of Nature and Natural Resources Red List of Threatened Species, this species is recognized as Rare (could be considered at risk) by Wagner *et al.* (1999b). *Microlepidia strigosa* var. *mauiensis* is included in the list of species in Hawaii's 2005 Comprehensive Wildlife Conservation Strategy (Mitchell *et al.* 2005).

COORDINATION WITH STATES

On February 11, 2010, we provided the Hawaii Division of Forestry and Wildlife with copies of our most recent candidate assessments for their review and comment. No additional information or comments were received.

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- Lau, J., Hawaii Biodiversity and Mapping Program, Telephone interview regarding status of *Microlepidia strigosa* var. *mauiensis*, March 14, 2007.
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- Welton, P., National Park Service, Electronic mail message regarding status of *Microlepidia strigosa* var. *mauiensis* on Maui, dated February 21, 2008.
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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve:

Acting Cecily A. Bohan 5/18/10
Regional Director, Region 1, Fish and Wildlife Service Date

Ronan W. Gould
ACTING
Director, Fish and Wildlife Service October 22, 2010

Concur:

Do not concur: _____ Date: _____
Director, Fish and Wildlife Service

Director's Remarks:

Date of annual review: _____ Date: April 19, 2010
Conducted by: Cheryl Phillipson, Pacific Islands FWO
Biologist, Prelisting and Listing Program

Comments:

PIFWO Review

Reviewed by: Christa Russell Date: April 23, 2010
Prelisting and Listing Program Coordinator

Marilet Zablan Date: April 26, 2010
Assistant Field Supervisor, Endangered Species Division

Gina Shultz Date: April 30, 2010
Acting Field Supervisor